www.elsevier.com/locate/rie

A Statistical Physics Implementation of Coase's Theory of the Firm

Sergey V. Buldyrev, Michael A. Salinger, H. Eugene Stanley

PII: S1090-9443(16)30147-8
DOI: http://dx.doi.org/10.1016/j.rie.2016.08.005
Reference: YREEC688

To appear in: *Research in Economics*

Received date: 15 June 2016
Revised date: 4 August 2016
Accepted date: 5 August 2016

Cite this article as: Sergey V. Buldyrev, Michael A. Salinger and H. Eugene Stanley, A Statistical Physics Implementation of Coase's Theory of the Firm, *Research in Economics,* http://dx.doi.org/10.1016/j.rie.2016.08.005

A Statistical Physics Implementation of Coase's Theory of the Firm

Sergey V. Buldyrev[a]
Michael A. Salinger[b]
H. Eugene Stanley[a]
First Draft: June 2003
This Draft: July 2016

[a] Department of Physics and Center for Polymer Studies, Boston University
[b] Department of Markets, Public Policy, and Law, Questrom School of Business, Boston University

Abstract

We present a stochastic, dynamic model of firm growth that captures the essential features of Coase's theory of the firm and reproduces important statistical regularities in firm size and growth. For the model to generate these statistical regularities, the parameters must be tuned so that firms involved in "unrelated" activities evolve. Thus, at the same time that the model predicts the statistical properties of firm growth, it suggests that attempts to validate Coase's theory at the level of the individual firm might be futile. The model draws on models of critical phenomena from statistical physics, the motivation being that the observed statistical properties of firm growth are similar to the statistical properties of physical systems near their critical point.

We have benefitted from comments by L.A.N. Amaral, Ulrich Doraszelski, Shlomo Havlin, and Oliver Williamson. We gratefully acknowledge research support from NSF grant SES-0113103.